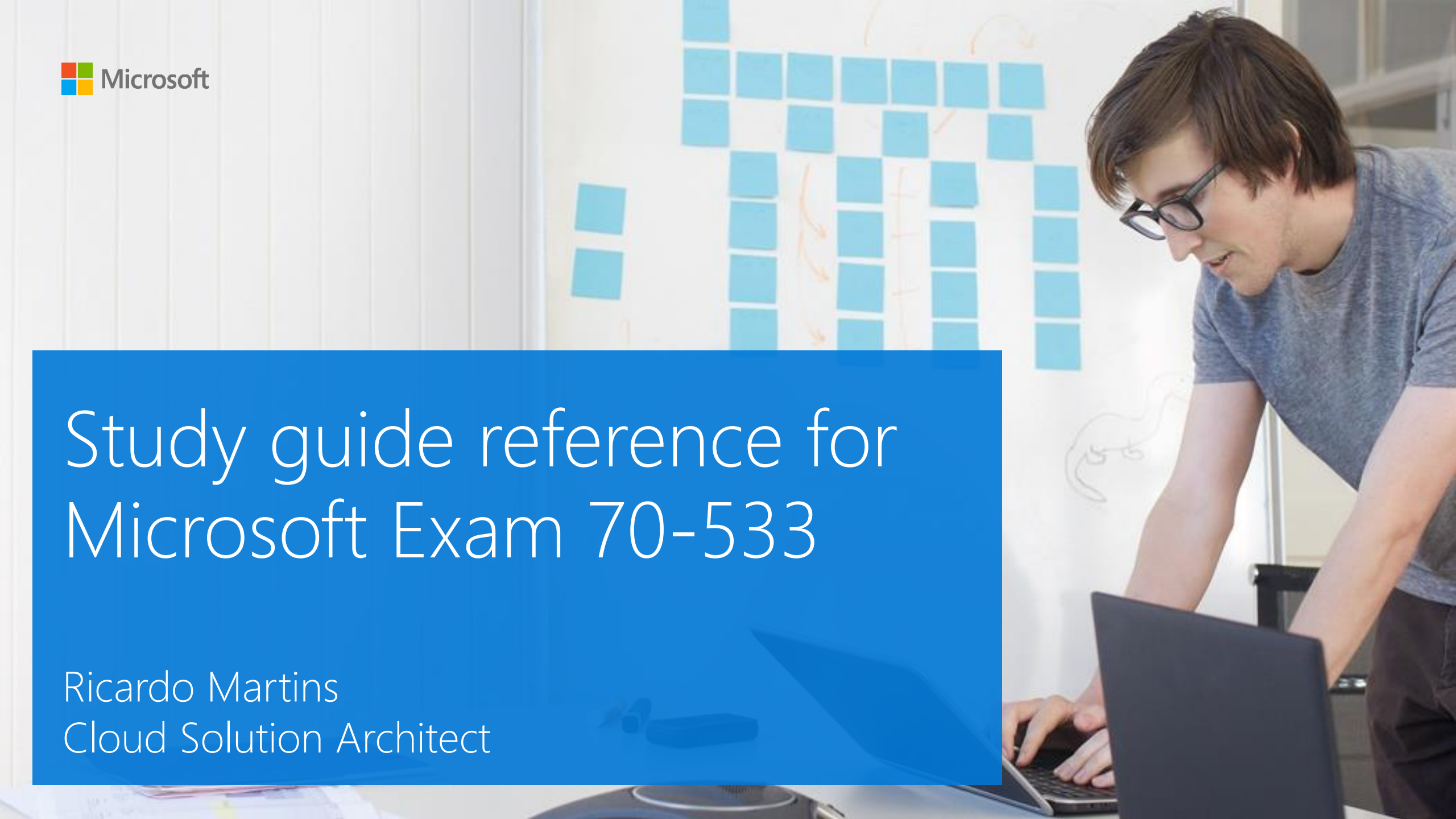


Microsoft

Study guide reference for Microsoft Exam 70-533

Ricardo Martins
Cloud Solution Architect

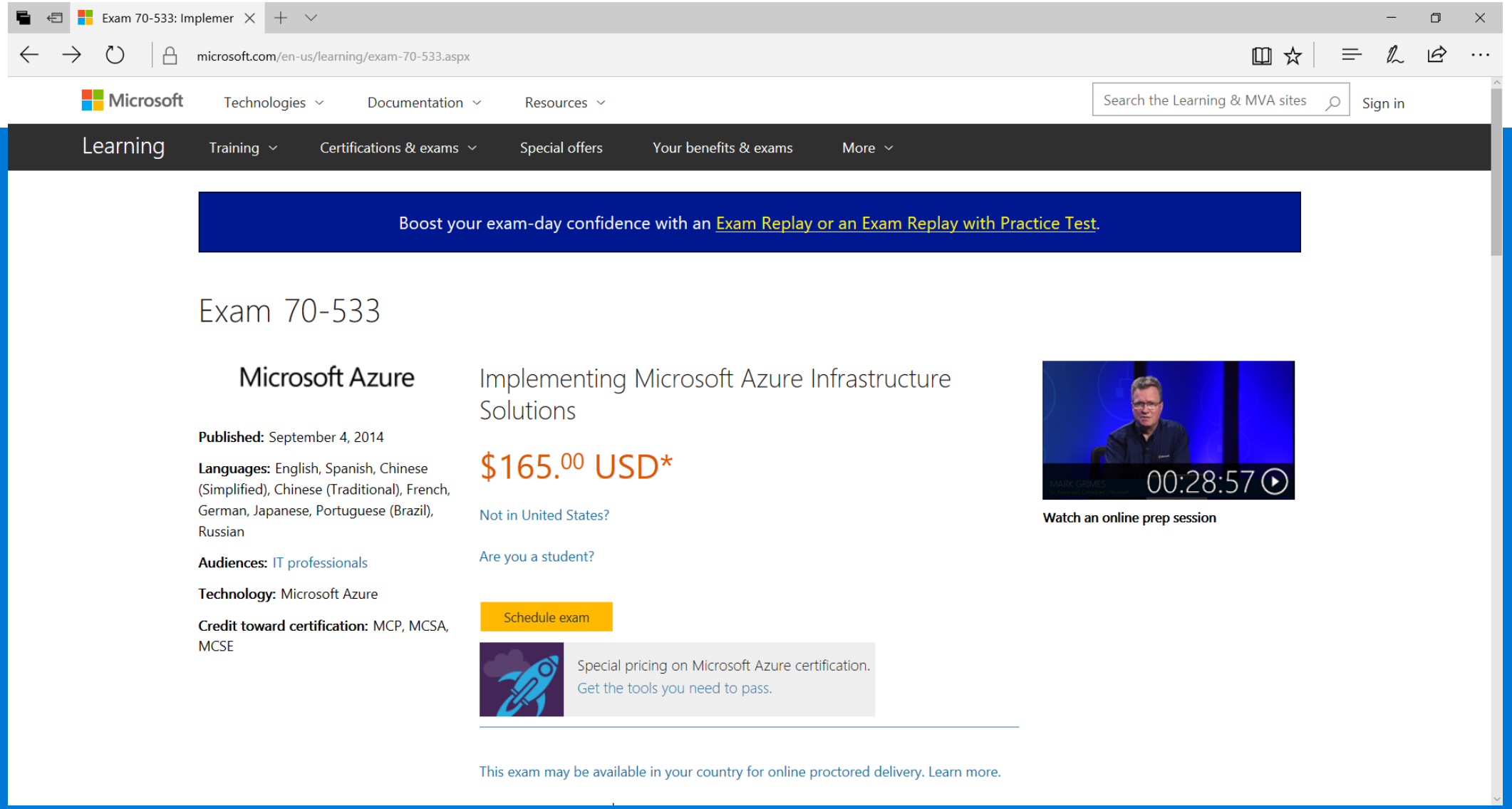
Useful links

Azure subscription and service limits, quotas, and constraints
http://azure.microsoft.com/en-us/documentation/articles/azure-subscription-service-limits/

Azure Documentation Center
http://azure.microsoft.com/en-us/documentation/

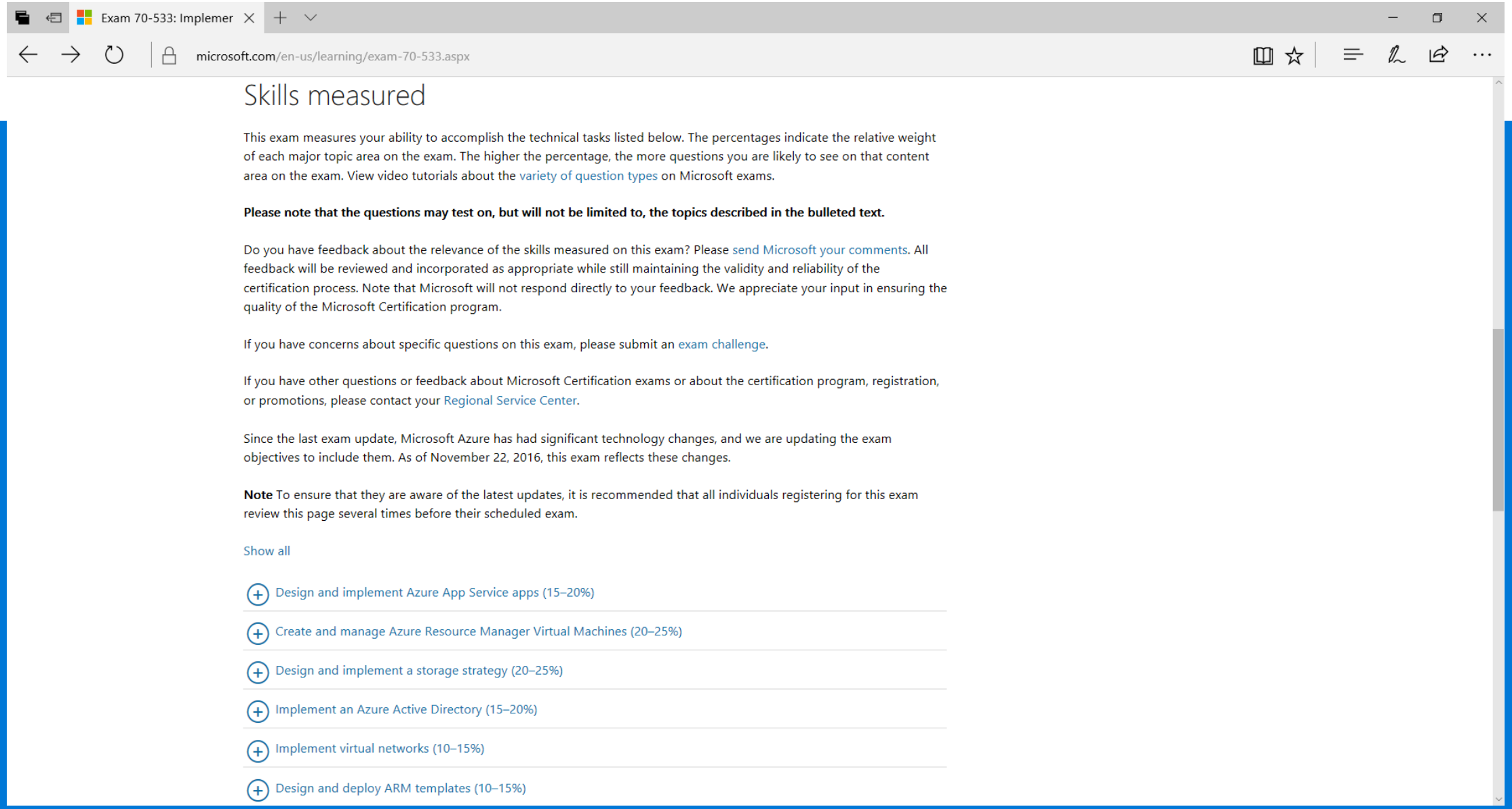
Azure Free Trial
http://azure.microsoft.com/en-us/pricing/free-trial/

Reference



https://www.microsoft.com/en-us/learning/exam-70-533.aspx

Skills measured



Skills measured

This exam measures your ability to accomplish the technical tasks listed below. The percentages indicate the relative weight of each major topic area on the exam. The higher the percentage, the more questions you are likely to see on that content area on the exam. View video tutorials about the variety of question types on Microsoft exams.

Please note that the questions may test on, but will not be limited to, the topics described in the bulleted text.

Do you have feedback about the relevance of the skills measured on this exam? Please send Microsoft your comments. All feedback will be reviewed and incorporated as appropriate while still maintaining the validity and reliability of the certification process. Note that Microsoft will not respond directly to your feedback. We appreciate your input in ensuring the quality of the Microsoft Certification program.

If you have concerns about specific questions on this exam, please submit an exam challenge.

If you have other questions or feedback about Microsoft Certification exams or about the certification program, registration, or promotions, please contact your Regional Service Center.

Since the last exam update, Microsoft Azure has had significant technology changes, and we are updating the exam objectives to include them. As of November 22, 2016, this exam reflects these changes.

Note To ensure that they are aware of the latest updates, it is recommended that all individuals registering for this exam review this page several times before their scheduled exam.

Show all

- Design and implement Azure App Service apps (15–20%)
- Create and manage Azure Resource Manager Virtual Machines (20–25%)
- Design and implement a storage strategy (20–25%)
- Implement an Azure Active Directory (15–20%)
- Implement virtual networks (10–15%)
- Design and deploy ARM templates (10–15%)

Design and Implement Azure App Service apps (15-20 %)

Deploy Web Apps

- Define deployment slots; roll back deployments; implement pre- and post- deployment actions; create, configure, and deploy packages; create App Service plans; migrate Web Apps between App Service plans; create a Web App within an App Service plan

How to deploy websites	https://azure.microsoft.com/en-us/documentation/articles/web-sites-deploy/
Deploy in Slots	https://azure.microsoft.com/en-us/documentation/articles/web-sites-staged-publishing/
Website Backups	https://azure.microsoft.com/en-us/documentation/articles/web-sites-backup/
Website Restore	https://azure.microsoft.com/en-us/documentation/articles/web-sites-restore/
How to use Webjobs to run tasks in the background	https://azure.microsoft.com/en-us/documentation/articles/web-sites-create-web-jobs/

Design and Implement Azure App Service apps (15-20 %)

Configure Web Apps

- Define and use app settings, connection strings, handlers, and virtual directories; configure certificates and custom domains; configure SSL bindings and runtime configurations; manage Web Apps by using Azure PowerShell and Xplat-CLI

Setting up websites	https://azure.microsoft.com/en-us/documentation/articles/web-sites-configure/
Custom settings and application settings - with Stefan Schackow	https://azure.microsoft.com/en-us/documentation/videos/configuration-and-app-settings-of-azure-web-sites/
How Application Strings and Connection Strings Work	https://azure.microsoft.com/en-us/blog/windows-azure-web-sites-how-application-strings-and-connection-strings-work/
Setting up a custom domain for a website	https://azure.microsoft.com/en-us/documentation/articles/web-sites-custom-domain-name/
Configuring HTTPS for a Website	https://azure.microsoft.com/en-us/documentation/articles/web-sites-configure-ssl-certificate/

Design and Implement Azure App Service apps (15-20 %)

Configure Web Apps

- Define and use app settings, connection strings, handlers, and virtual directories; configure certificates and custom domains; configure SSL bindings and runtime configurations; manage Web Apps by using Azure PowerShell and Xplat-CLI

Using Traffic Manager	https://blogs.msdn.microsoft.com/waws/2014/03/24/using-azure-traffic-manager-with-azure-web-sites/ https://azure.microsoft.com/en-us/documentation/articles/traffic-manager-overview/ https://azure.microsoft.com/en-us/documentation/articles/traffic-manager-endpoints/ https://azure.microsoft.com/en-us/documentation/articles/traffic-manager-routing-methods/ https://azure.microsoft.com/en-us/documentation/articles/traffic-manager-powershell-arm/
Managing Azure Websites with PowerShell	https://channel9.msdn.com/Series/Windows-Azure-Web-Sites-Tutorials/Managing-Windows-Azure-Web-Sites-with-PowerShell
Installing and Configuring Azure Cross-Platform Command-Line Interface	https://azure.microsoft.com/en-us/documentation/articles/xplat-cli-install/ https://azure.microsoft.com/en-us/documentation/articles/xplat-cli-azure-resource-manager/

Design and Implement Azure App Service apps (15-20 %)

Configure Web Apps

- Define and use app settings, connection strings, handlers, and virtual directories; configure certificates and custom domains; configure SSL bindings and runtime configurations; manage Web Apps by using Azure PowerShell and Xplat-CLI

Managing database connections in Azure WebSites	http://blog.davidebbo.com/2012/09/managing-database-connections-in-azure.html
Azure Support to development stacks	https://azure.microsoft.com/en-us/blog/windows-azure-websites-development-stacks-support/

Design and Implement Azure App Service apps (15-20 %)

Configure diagnostics, monitoring, and analytics

- Retrieve diagnostics data; view streaming logs; configure endpoint monitoring, configure alerts; configure diagnostics; use remote debugging; monitor Web App resources

How to monitor websites	https://azure.microsoft.com/en-us/documentation/articles/web-sites-monitor/
How to receive alert notifications and manage alert rules	https://azure.microsoft.com/en-us/documentation/articles/insights-receive-alert-notifications/
How to Monitor Web Application Performance	https://azure.microsoft.com/en-us/documentation/articles/insights-perf-analytics/
Troubleshooting Web Applications	https://azure.microsoft.com/en-us/documentation/articles/web-sites-dotnet-troubleshoot-visual-studio/
How to Enable Diagnostic Logs for WebApps	https://azure.microsoft.com/en-us/documentation/articles/web-sites-enable-diagnostic-log/
Viewing log streaming	https://azure.microsoft.com/en-us/documentation/videos/log-streaming-with-azure-web-sites/

Design and Implement Azure App Serivce apps (15-20 %)

Configure Web Apps for scale and resilience

- Configure auto-scale using built-in and custom schedules, configure by metric, change the size of an instance, configure Traffic Manager

Using auto-scale on websites	https://azure.microsoft.com/en-us/documentation/articles/web-sites-scale/
When to auto-scale Websites - with Stefan Schackow	https://azure.microsoft.com/en-us/documentation/videos/azure-web-sites-free-vs-standard-scaling/
Auto Scale of Websites via CPU or Scheduling	https://azure.microsoft.com/en-us/documentation/videos/auto-scaling-azure-web-sites/
How the Azure Website Scales - with Stefan Schackow	https://azure.microsoft.com/en-us/documentation/videos/how-azure-web-sites-scale/

Design and Implement Azure App Service apps (15-20 %)

Manage application service plans

- Create application service plans; Migrate Web applications between application services; Create a Web application in an application service plan

What is the service plan?	https://azure.microsoft.com/en-us/documentation/articles/app-service-value-prop-what-is/
Azure Websites Service Plans	https://azure.microsoft.com/en-us/documentation/articles/azure-web-sites-web-hosting-plans-in-depth-overview/
Details about service plans	https://azure.microsoft.com/en-us/pricing/details/app-service/

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Deploy workloads on Azure Resource Manager (ARM) virtual machines (VMs)

- Identify workloads that can and cannot be deployed; run workloads, including Microsoft and Linux; create VMs; connect to a Windows/Linux VM

Azure Virtual Machines FAQ	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-linux-classic-faq/
Documentation of virtual machines	https://azure.microsoft.com/en-us/documentation/services/virtual-machines/
Server software support for Azure virtual machines	https://support.microsoft.com/en-us/kb/2721672
Creating Windows Virtual Machines	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-windows-hero-tutorial/
Creating Linux virtual machines	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-linux-quick-create-cli/
Service Management Cmdlets - Deploying and Managing Virtual Machines	https://msdn.microsoft.com/en-us/library/azure/dn495240.aspx

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Perform configuration management

- Automate configuration management by using PowerShell Desired State Configuration (DSC) and VM Agent (custom script extensions); configure VMs using a configuration management tool, such as Puppet or Chef; enable remote debugging

Introduction to the Azure PowerShell DSC (Desired State Configuration)	https://blogs.msdn.microsoft.com/powershell/2014/08/07/introducing-the-azure-powershell-dsc-desired-state-configuration-extension/
Automating configuration of VMs using PowerShell DSC	https://azure.microsoft.com/en-us/blog/automating-vm-configuration-using-powershell-dsc-extension/
Configuring a VM using PowerShell DSC	https://blogs.msdn.microsoft.com/powershell/2014/04/03/configuring-an-azure-vm-using-powershell-dsc/
Starting a PowerShell DSC Pull Server and Client	https://www.opsgility.com/blog/2013/11/29/bootstrapping-a-powershell-dsc-pull-server-and-client/
Automating custom VM tasks using custom scripts	https://azure.microsoft.com/en-us/blog/automating-vm-customization-tasks-using-custom-script-extension/
Configuring an Azure VM in Hands-Free Mode	https://blogs.technet.microsoft.com/dcaro/2014/04/22/hands-free-configuration-of-your-vm-in-microsoft-azure/

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Perform configuration management

- Automate configuration management by using PowerShell Desired State Configuration (DSC) and VM Agent (custom script extensions); configure VMs using a configuration management tool, such as Puppet or Chef; enable remote debugging

Puppet and Azure: Bringing DevOps to Large Corporations	https://channel9.msdn.com/Events/Build/2014/2-658
Puppetlabs: Microsoft Windows and Azure	http://puppetlabs.com/solutions/microsoft
Chef and Microsoft Windows	https://www.chef.io/solutions/windows/
Using Chef to Manage Resources in Azure	https://msopentech.com/blog/2014/03/31/using-chef-to-manage-azure-resources/

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Deploy images and disks

- Create specialized and generalized images for Windows and Linux; Copy images between storage accounts and signatures; Load VHDs

Creating and uploading a VHD with Linux installed for Azure	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-linux-classic-create-upload-vhd/
Creating and uploading a Windows Server VHD to Azure	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-windows-classic-createupload-vhd/ https://blogs.technet.microsoft.com/canitpro/2014/05/07/step-by-step-upload-your-own-vhd-to-add-to-the-gallery-in-azure/
About disks and images on Azure	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-linux-about-disks-vhds/
AzCopy - Using in copies of blobs between accounts	https://blogs.msdn.microsoft.com/windowsazurestorage/2013/03/31/azcopy-using-cross-account-copy-blob/

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Configure VM network

- Public IP addresses, ACL, internal name resolution, vnet-level DNS, load balancing endpoints, HTTP and TCP healthcheck, public IPs, firewall rules, server direct return and Keep Alive

Azure Virtual Network Overview	https://azure.microsoft.com/en-us/documentation/articles/virtual-networks-overview/
How to set up endpoints for virtual machines	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-windows-classic-setup-endpoints/
About access control lists	https://azure.microsoft.com/en-us/documentation/articles/virtual-networks-acl/
How to Configure a Private Static IP	https://azure.microsoft.com/en-us/documentation/articles/virtual-networks-reserved-private-ip/ https://www.opsgility.com/blog/windows-azure-powershell-reference-guide/setting-static-ip-addresses-in-a-virtual-network/
DNS name resolution for instances	https://azure.microsoft.com/en-us/documentation/articles/virtual-networks-name-resolution-for-vms-and-role-instances/

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Configure VM network

- Public IP addresses, ACL, internal name resolution, vnet-level DNS, load balancing endpoints, HTTP and TCP healthcheck, public IPs, firewall rules, server direct return and Keep Alive

Azure Load Balancer	https://azure.microsoft.com/en-us/documentation/articles/load-balancer-overview/ https://azure.microsoft.com/en-us/blog/microsoft-azure-load-balancing-services/
Setting up a DMZ on Azure	http://www.rajinders.com/2013/06/11/setting-up-dmz-in-windows-azure/
Configurable Idle Timeout on the Azure Load balancer	https://azure.microsoft.com/en-us/blog/new-configurable-idle-timeout-for-azure-load-balancer/
VM Isolation Options on a VNET	https://azure.microsoft.com/en-us/blog/network-isolation-options-for-machines-in-windows-azure-virtual-networks/
Creating a DNS Server on Azure IaaS	https://blogs.msdn.microsoft.com/mcsuksoldev/2014/03/04/creating-a-dns-server-in-azure-iaas/

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Configure VM network

- Public IP addresses, ACL, internal name resolution, vnet-level DNS, load balancing endpoints, HTTP and TCP healthcheck, public IPs, firewall rules, server direct return and Keep Alive

Azure Load Internal Balancer for AlwaysOn	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-windows-portal-sql-alwayson-int-listener/

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Configuring VM resiliency

- Vertically scale and reduce VM sizes; Set availability settings

Managing Availability of Virtual Machines	https://azure.microsoft.com/en-us/documentation/articles/cloud-services-how-to-scale/
Managing Availability of Virtual Machines	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-windows-manage-availability/

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Designing and Implementing VM Storage

- Configure disk caching, plan storage capacity, configure operating system disk redundancy, configure shared storage using Azure File service, configure geo-replication, encrypt disks, implement ARM VMs with Standard and Premium Storage

About Virtual Machine Disks on Azure	https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-linux-about-disks-vhds/
Configuring file sharing with Azure File Service	https://blogs.technet.microsoft.com/uspartner_ts2team/2014/06/09/setting-up-a-file-share-for-the-new-azure-file-service/
Introduction to Azure File Service	http://blogs.msdn.com/b/windowsazurestorage/archive/2014/05/12/introducing-microsoft-azure-file-service.aspx
Encrypting a virtual machine disk using cloudlink	https://azure.microsoft.com/en-us/blog/azure-virtual-machine-disk-encryption-using-cloudlink/
Disk Encryption in VMs	http://clemmblog.azurewebsites.net/disk-encryption-azure-vms/
Exploring Azure Disks, Drives and Images	https://blogs.msdn.microsoft.com/windowsazurestorage/2012/06/27/exploring-windows-azure-drives-disks-and-images/

Create and manage Azure Resource Manager Virtual Machines (20-25%)

Monitor ARM VMs

- Set up monitoring , alerts and diagnostics

Understanding Azure monitoring and notification alerts	https://azure.microsoft.com/en-us/documentation/articles/insights-receive-alert-notifications/
Create and use performance counters in an Azure Application	https://azure.microsoft.com/en-us/documentation/articles/cloud-services-dotnet-diagnostics-performance-counters/
Microsoft Azure Virtual Machine Monitoring with Azure Diagnostics Extension	https://azure.microsoft.com/pt-br/blog/windows-azure-virtual-machine-monitoring-with-wad-extension/
Overview of Monitoring in Microsoft Azure	https://docs.microsoft.com/en-us/azure/monitoring-and-diagnostics/monitoring-overview
What is Azure Diagnostics	https://docs.microsoft.com/en-us/azure/monitoring-and-diagnostics/azure-diagnostics
Overview of Azure Monitor	https://docs.microsoft.com/en-us/azure/monitoring-and-diagnostics/monitoring-overview-azure-monitor

Design and implement a storage strategy (20-25%)

Implement Azure storage blobs and Azure files

- Read data; Change data; Define metadata in a container; Use encryption (SSL); Run an asynchronous copy of blob; Configure a Content Distribution Network (CDN); Implement storage for backup and disaster recovery; Configure Azure backup; Define blob hierarchies; Configure custom domains; Configure the import and export service; Deploy Premium Storage

Azure Storage Documentation	https://azure.microsoft.com/en-us/documentation/services/storage/
Creating a storage account	https://azure.microsoft.com/en-us/documentation/articles/storage-create-storage-account/
Set up a custom domain for a data blobs	https://azure.microsoft.com/en-us/documentation/articles/storage-custom-domain-name/
Using the Azure Import / Export service to transfer data to a blob storage	https://azure.microsoft.com/en-us/documentation/articles/storage-import-export-service/
How to set up a CDN	https://azure.microsoft.com/en-us/documentation/articles/cdn-create-new-endpoint/

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Migrating data to Azure Files	https://azure.microsoft.com/en-us/blog/migrating-data-to-microsoft-azure-files/
Microsoft Azure Backup - Documentation	https://azure.microsoft.com/en-us/documentation/services/backup/
Azure Storage scalability limits	https://azure.microsoft.com/en-us/documentation/articles/storage-scalability-targets/
How to Perform an Asynchronous Copy of Blob	https://blogs.msdn.microsoft.com/windowsazurestorage/2012/06/12/introducing-asynchronous-cross-account-copy-blob/
Disaster Recovery and High Availability for Azure Applications	https://azure.microsoft.com/en-us/documentation/articles/resiliency-disaster-recovery-high-availability-azure-applications/

Design and implement a storage strategy (20-25%)

Manage access

- Create and manage shared access signatures, use stored access policies, regenerate keys

Managing Storage Accounts	https://azure.microsoft.com/en-us/documentation/articles/storage-create-storage-account/
Authentication for Azure Storage services	https://msdn.microsoft.com/en-us/library/azure/dd179428.aspx
Creating and Managing Shared Access Signatures	https://azure.microsoft.com/en-us/documentation/articles/storage-dotnet-shared-access-signature-part-1/ https://azure.microsoft.com/en-us/documentation/articles/storage-dotnet-shared-access-signature-part-2/

Design and implement a storage strategy (20-25%)

Configure diagnostics, monitoring, and analytics

- Set retention policies and logging levels, analyze logs

How to monitor a storage account	https://azure.microsoft.com/en-us/documentation/articles/storage-monitor-storage-account/

Design and implement a storage strategy (20-25%)

Implement Azure SQL Databases

- Choose the appropriate database tier and performance level; configure point-in-time recovery, geo-replication, and data sync; import and export data and schema; design a scaling strategy

Azure SQL Database - Documentation	https://azure.microsoft.com/en-us/documentation/services/sql-database/
Choosing Between SQL Server on a Virtual Machine or Azure SQL Database	https://azure.microsoft.com/en-us/blog/choosing-between-sql-server-in-windows-azure-vm-windows-azure-sql-database/
Azure SQL Database - Service Layers	https://azure.microsoft.com/en-us/documentation/articles/sql-database-service-tiers/
Active Geo-Replication for Azure SQL Database	https://azure.microsoft.com/en-us/documentation/articles/sql-database-geo-replication-overview/
Geo-Replication Standard for Azure SQL Database	https://azure.microsoft.com/en-us/blog/azure-sql-database-standard-geo-replication/

Design and implement a storage strategy (20-25%)

Implement Azure SQL Databases

- Choose the appropriate database tier and performance level; configure point-in-time recovery, geo-replication, and data sync; import and export data and schema; design a scaling strategy

Business Continuity and Disaster Recovery with Azure SQL Database	https://azure.microsoft.com/en-us/documentation/articles/sql-database-business-continuity/
Performance and Scalability in Azure SQL Database	https://azure.microsoft.com/en-us/documentation/articles/sql-database-performance-guidance/
MVA - Windows Azure SQL Database	https://mva.microsoft.com/en-US/training-courses/windows-azure-sql-database-8280

Design and implement a storage strategy (20-25%)

Implement recovery services

- Create a backup vault, deploy a backup agent, back up and restore data

Azure Backup - Documentation	https://azure.microsoft.com/en-us/documentation/services/backup/
Azure Backup - Documentation	https://azure.microsoft.com/en-us/services/site-recovery/
Azure Backup - Overview	https://azure.microsoft.com/en-us/documentation/articles/backup-introduction-to-azure-backup/
How to use Azure Backup	https://azure.microsoft.com/en-us/documentation/articles/backup-configure-vault/

Integrate an Azure Active Directory (15-20%)

Integrate an Azure Active Directory (Azure AD) with existing directories

- Implement Azure AD Connect and single sign-on with on-premises Windows Server 2012 R2, add custom domains, monitor Azure AD

Azure Active Directory – Documentation	https://azure.microsoft.com/en-us/documentation/services/active-directory/
Azure Active Directory – What is it?	https://azure.microsoft.com/en-us/documentation/articles/active-directory-whatis/
Azure Active Directory – Directory Integration	https://msdn.microsoft.com/en-us/library/azure/jj573653.aspx
Single Sign-On Directory Synchronization Scenario	https://technet.microsoft.com/en-us/library/dn441213.aspx
Azure Active Direcotory – Add your domain	https://azure.microsoft.com/en-us/documentation/articles/active-directory-add-domain/
About Office 365 and Active Directory	https://technet.microsoft.com/en-us/library/dn509517.aspx

Integrate an Azure Active Directory (15-20%)

Integrate an Azure Active Directory (Azure AD) with existing directories

- Implement Azure AD Connect and single sign-on with on-premises Windows Server 2012 R2, add custom domains, monitor Azure AD

Implementing DirSync	https://azure.microsoft.com/en-us/documentation/articles/active-directory-aadconnect/
Deployment Scenarios for O365 with SSO and Azure	https://technet.microsoft.com/en-us/library/dn509537.aspx

Integrate an Azure Active Directory (15-20%)

Configure Application Access

- Configure single sign-on with SaaS applications using federation and password based, add users and groups to applications, revoke access to SaaS applications, configure access, configure federation with Facebook and Google ID

Azure Active Directory Developer's Guide	https://azure.microsoft.com/en-us/documentation/articles/active-directory-developers-guide/
Integrating applications with Azure Active Directory	https://azure.microsoft.com/en-us/documentation/articles/active-directory-integrating-applications/
Introduction to the access panel	https://azure.microsoft.com/en-us/documentation/articles/active-directory-saas-access-panel-introduction/
Azure Active Directory access panel improvements	https://blogs.technet.microsoft.com/enterprisemobility/2013/07/07/application-access-enhancements-for-windows-azure-active-directory/ https://blogs.technet.microsoft.com/enterprisemobility/2014/05/21/identity-and-access-management-for-the-cloud/
Azure Active Directory - User Management	https://azure.microsoft.com/en-us/documentation/articles/active-directory-manage-groups/

Integrate an Azure Active Directory (15-20%)

Configure Application Access

- Configure single sign-on with SaaS applications using federation and password based, add users and groups to applications, revoke access to SaaS applications, configure access, configure federation with Facebook and Google ID

Azure Active Directory – Group Management	https://azure.microsoft.com/en-us/documentation/articles/active-directory-accessmanagement-manage-groups/
Management of Azure Active Directory	https://azure.microsoft.com/en-us/documentation/articles/active-directory-administer/
Access Control Service 2.0	https://msdn.microsoft.com/library/azure/hh147631.aspx
Adding MFA to AAD	https://azure.microsoft.com/en-us/documentation/articles/multi-factor-authentication-get-started-cloud/
Checking access and usage reports	https://azure.microsoft.com/en-us/documentation/articles/active-directory-view-access-usage-reports/
Federation with Facebook and GoogleID	https://msdn.microsoft.com/en-us/library/hh446535.aspx https://azure.microsoft.com/en-us/documentation/articles/fundamentals-identity/

Integrate an Azure Active Directory (15-20%)

Integrate an app with Azure AD

- Web applications (WS-federation); Desktop applications (OAuth); API graph

Authentication scenarios in Azure Active Directory	https://azure.microsoft.com/en-us/documentation/articles/active-directory-authentication-scenarios/
Azure Active Directory Authentication Protocols	https://azure.microsoft.com/en-us/documentation/articles/active-directory-developers-guide/
Azure Active Directory Graph API	https://msdn.microsoft.com/en-us/library/azure/hh974476.aspx https://github.com/Azure-Samples/active-directory-dotnet-graphapi-web
WebApps (WS-Federation)	https://github.com/Azure-Samples/active-directory-dotnet-webapp-openidconnect
What is Application Access and SSO with ADL	https://azure.microsoft.com/en-us/documentation/articles/active-directory-appssoaccess-whatis/

Integrate an Azure Active Directory (15-20%)

Integrate an app with Azure AD

- Web applications (WS-federation); Desktop applications (OAuth); API graph

How to integrate desktop applications with the AAD (OAuth)	https://azure.microsoft.com/en-us/documentation/samples/active-directory-dotnet-native-desktop/ https://azure.microsoft.com/en-us/documentation/articles/active-directory-devquickstarts-dotnet/ https://azure.microsoft.com/en-us/documentation/articles/active-directory-protocols-oauth-code/

Integrate an Azure Active Directory (15-20%)

Implement Azure AD B2C and Azure B2B

- Create an Azure AD B2C Directory, register an application, implement social identity provider authentication, enable multi-factor authentication, set up self-service password reset, implement B2B collaboration, configure partner users, integrate with applications

AD B2C Overview	https://docs.microsoft.com/en-us/azure/active-directory-b2c/active-directory-b2c-overview
What is Azure AD B2B collaboration	https://docs.microsoft.com/en-us/azure/active-directory/active-directory-b2b-what-is-azure-ad-b2b
Azure Active Directory B2C: Register your application	https://docs.microsoft.com/en-us/azure/active-directory-b2c/active-directory-b2c-app-registration
Active Directory B2C Documentation	https://docs.microsoft.com/en-us/azure/active-directory-b2c/
Azure Active Directory B2C: Set up self-service password reset for your consumers	https://docs.microsoft.com/en-us/azure/active-directory-b2c/active-directory-b2c-reference-sspr
Add users from other directories or partner companies in Azure Active Directory	https://docs.microsoft.com/en-us/azure/active-directory/active-directory-create-users-external

Implement Virtual Networks (10-15%)

Configure virtual networks

- Deploy a VM into a virtual network; configure external and internal load balancing; implement Application Gateway; design subnets; configure static, public, and private IP addresses; set up Network Security Groups (NSGs), DNS at the virtual network level, HTTP and TCP health probes, public IPs, User Defined Routes (UDRs), firewall rules, and direct server return

Virtual Networks - Documentation	https://azure.microsoft.com/en-us/documentation/services/virtual-network/
Creating a virtual network on the Azure portal	https://azure.microsoft.com/en-us/documentation/articles/virtual-networks-create-vnet-arm-pportal/
Azure IP Addressing	https://azure.microsoft.com/en-us/documentation/articles/virtual-network-ip-addresses-overview-arm/
Azure Load Balancer	https://azure.microsoft.com/en-us/documentation/articles/load-balancer-overview/

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Azure Internal Load Balancer	https://azure.microsoft.com/en-us/documentation/articles/load-balancer-internal-overview/ https://www.opsgility.com/blog/windows-azure-powershell-reference-guide/using-the-internal-load-balancer-with-azure-virtual-machines/
Virtual Networks – Overview	https://azure.microsoft.com/en-us/documentation/articles/virtual-networks-overview/
User-defined routes and IP forwarding	https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-udr-overview

Implement Virtual Networks (10-15%)

Modify network configuration

- Modify subnets, NSGs, and UDRs

Create, change, or delete a virtual network subnet	https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-manage-subnet
Create, change, or delete network interfaces	https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-network-interface
Manage NSGs	https://docs.microsoft.com/en-us/azure/virtual-network/virtual-network-manage-nsg-arm-portal
Filter network traffic with network security groups	https://docs.microsoft.com/en-us/azure/virtual-network/virtual-networks-nsg

Implement Virtual Networks (10-15%)

Design and implement a multi-site or hybrid network

- Choose the appropriate solution between ExpressRoute, site-to-site, and point-to-site; choose the appropriate gateway; identify supported devices and software VPN solutions; identify networking prerequisites; configure virtual networks and multi-site virtual networks

About secure connectivity between environments	https://azure.microsoft.com/en-us/documentation/articles/vpn-gateway-cross-premises-options/
About VPN devices for site-to-site connections	https://azure.microsoft.com/en-us/documentation/articles/vpn-gateway-about-vpn-devices/
Connect multiple local sites with a virtual network	https://azure.microsoft.com/en-us/documentation/articles/vpn-gateway-multi-site/
Configure a VPN connection between two virtual networks on Azure	https://azure.microsoft.com/en-us/documentation/articles/hdinsight-hbase-geo-replication-configure-vnets/

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Configure a vnet-to-vnet connection on the ARM path	https://azure.microsoft.com/en-us/documentation/articles/vpn-gateway-vnet-vnet-rm-ps/
Implementing a hybrid network architecture between Azure and an on-premise VPN	https://azure.microsoft.com/en-us/documentation/articles/guidance-hybrid-network-vpn/
Create a virtual network using the Azure portal	https://azure.microsoft.com/en-us/documentation/articles/virtual-networks-create-vnet-arm-pportal/

Design and deploy ARM templates (10-15%)

Implement ARM templates

- Author ARM templates; create ARM templates to deploy ARM Resource Providers resources; deploy templates with PowerShell, CLI, and REST API

Authoring Azure Resource Manager templates	https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-authoring-templates
Deploy resources with Resource Manager templates and Azure portal	https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-template-deploy-portal
Deploy resources with Resource Manager templates and Azure PowerShell	https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-template-deploy
Deploy resources with Resource Manager templates and Azure CLI	https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-template-deploy-cli
Deploy resources with Resource Manager templates and Resource Manager REST API	https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-template-deploy-rest
Create your first Azure Resource Manager template	https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-manager-create-first-template

Design and deploy ARM templates (10-15%)

Control access

- Leverage service principles with ARM authentication, use Azure Active Directory Authentication with ARM, set management policies, lock resources

Use portal to create an Azure Active Directory application and service principal that can access resources	https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-create-service-principal-portal
Use Resource Manager authentication API to access subscriptions	https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-manager-api-authentication
Lock resources to prevent unexpected changes	https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-lock-resources

Design and deploy ARM templates (10-15%)

Design role-based access control (RBAC)

- Secure resource scopes, such as the ability to create VMs and Azure Web Apps; implement Azure role-based access control (RBAC) standard roles; design Azure RBAC custom roles

Get started with Role-Based Access Control in the Azure portal	https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-what-is
Built-in roles for Azure role-based access control	https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-built-in-roles
Use Role-Based Access Control to manage access to your Azure subscription resources	https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-configure
Create custom roles for Azure Role-Based Access Control	https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-custom-roles
Role Based Access Control and Azure Subscription GUID	https://blogs.msdn.microsoft.com/uk_faculty_connection/2017/05/30/role-based-access-control-and-azure-subscription-guid/
Intro on role-based access control	https://docs.microsoft.com/en-us/azure/active-directory/role-based-access-control-create-custom-roles-for-internal-external-users

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